



Research Article

Evaluation of the Antidiabetic Activity of the Ethanolic Extract of *Phyla Nodiflora* Leaves in Wistar Albino Rats Subjected to Streptozotocin-Induced Hyperglycemia

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ABSTRACT

Objective: Diabetes mellitus is a biochemical disease that has become a pandemic in the twenty-first century. Ethanolic extract of *Phyla nodiflora*, is used in a variety of alternative therapies in streptozotocin-triggered in diabetic Rats, the impact of *phyla nodiflora* on blood sugar levels was examined in immediate & subacute research models. **Material and method:** Streptozotocin were used to develop hyperglycemia in albino rats, who were subsequently separated into six groups at random. Medicines were given orally in the acute study as follows: control reference (Glibenclamide 2 mg/kg), ethanolic extract of *Phyla nodiflora* 200 mg/kg, ethanolic extract of *Phyla nodiflora* 400 mg/kg. In the acute study, blood sugar samples were assessed before and after dosage at 1, 7, and 14 days respectively. **Result and Discussion:** After hyperglycaemic test it was found that the 200 & 400 mg /kg concentration of ethanolic extract of *Phyla nodiflora*. Significantly minimize in serum sugar concentration ($18.83 \pm 3.879 \downarrow$ & $0.84 \pm 10.93 \downarrow$) (P value less than 0.05) *, (P value less than 0.001) ** (P value less than 0.0001) *** as on comparison with control and positive control.

KEYWORD: *Phyla nodiflora*, Glibenclamide, Streptozotocin, Hyperglycemia.

Diabetes Mellitus (DM)

Diabetes, a severe metabolic condition analysed by persistently elevated blood glucose levels in the late 1700s, British physician John Rolle added the word "mellitus," which means "from honey," to distinguish the disorder from reactive hyperglycemia, i.e., also linked with excessive urination. It is rapidly spreading global issue with significant social; health; & economic implications. In 2010, it was projected that 285 million people worldwide (about 6.4 % of adult population) were affected by this condition (KD Tripathi., 2006). In the pursuit of alternative management or treatment, this figure is expected to grow to 430 million. The rise can be attributed to two factors: an ageing populace and

overweight. (Care. Jan and Geneva., 2010), (World Health Organization., 2009).

Sushruta & Charaka, Indian medics, recognized type 1 & type 2 diabetics for the very first occasion in 400-500 CE, with the type-1 being related with young and type-2 with being obese (Prabhakar and Doble., 2008). In 1921 through 1922, Canadians Banting & Herbert Best discovered and refined insulin, which became the first appropriate cure for diabetes (National Diabetes Information Clearinghouse (NDIC) review, 2009), (Kawa et al., 2013), (Wang et al., 2011).

Common symptoms

Losing weight, proteinuria, polydipsia (increased thirst), and polyphagia are all hallmark indications of uncontrolled hyperglycemia (increasing hunger). In type-1 diabetes, symptom usually develop quickly (weeks / months), where as in type-2 diabetes, signs normally appear considerably more gradually and may be faint or nonexistent (Young *et al.*, 2011).

The prognosis

Fasting sugar level of plasma ≥ 7.0 mmol. l⁻¹ (126 mg/dl)
Blood glucose ≥ 11.1 mmol. l⁻¹ (200 mg/dl) 2 hrs. after a 75 g oral glucose load as in a glucose-tolerance test
Hyperglycemia symptom and normal blood sugar levels ≥ 11.1 mmol. l⁻¹ (200 mg/dl)
Glycated hemoglobin $\geq 6.5\%$.

Diagnosis and Preventive

Type 2 diabetes can frequently be avoided by maintaining a healthy weight by exercising regularly, & eating a balanced diet food. A diet rich in entire grain & fibre, as well as selecting beneficial fats like unsaturated fats present in walnuts vegetable oils, and fish, have been shown to be useful in preventing diabetes. Reducing sweetened drinks and consuming fewer meat as well as other fat intake items can also aid in diabetes management (Tuso *et al.*, 2002).

Treatments

Glibenclamide is commonly used as a 1st medication for type 2 diabetes since it has been shown to reduce death Regular aspirin usage, on the other hand, have never been shown to enhance outcomes in those with simple diabetes. Angiotensin-converting enzyme inhibitors, enhance results in people with diabetes, whereas angiotensin receptor blockers (ARBs) don't (Gyekye *et al.*, 2007), (Cruz *et al.*, 2012), (Sharker *et al.*, 2012).

Transplant of the pancreas

Individuals having type-1 diabetes which is already have significant consequences from their disease, such as end stage renal failure necessitating kidney transplantation, may be candidates for a pancreatic transplant (Gad *et al.*, 2006)

MATERIAL AND METHOD

Plant collection and authentication

Plant collection

The whole plant of *Phyla Nodiflora*. were collected from the local area of Lucknow known as GIPS garden Lucknow Uttar Pradesh and whole plant was authenticated by Mr. O.P. Verma Associate Professor Pharmacognosy, Goel institute of pharmacy and Sciences, Lucknow Ref. No.: GIPS/Ph'Cog./006/2021/003

Procedure of extract & powders form grinding

For ten days the whole plant was shadow dried at room temperature Then, using a mechanical crusher, this was grinding into powdered This material was recovered

utilizing ethanol, hexane and distilled water in order towards growing polarity. In a Soxhlet device, about g of crushed whole plant were evenly put into a thimble and recovered with 1000ml ethanol, hexane and distilled water, correspondingly. For recycling solvents, a heating mantle supplied continuous heat for every solvent, the extract procedure lasts about 1-2 hours. The surplus solvent was drained and the dried extract were stored at 4°C for further phytochemical and pharmacologic screenings (Ramadan *et al.*, 2013).

Screening of phytochemicals

The ethanol, distilled water and hexane extract of phyla nodiflora was tested qualitatively for alkaloids, polysaccharides, glycosides, phenolic compounds, peptides, free amino acids, and terpenes, among other elements (Thalapanani *et al.*, 2008).

Chemicals or reagents

Goel institute of pharmacy & Sciences, Lucknow provided potatoes starches trichloroacetic acid, and Folin-Ciocalteu reagents DNS, Tris buffer, linolenic, and ammonium molybdate. The -amylase and -glucosidase enzymes, as well as xanthine oxidase quercetin, hypoxanthine, and pyrocatechol., glucose testing kit acarbose, ferrozine (2'2'-azobis (2-amidino propane) dihydrochloride) and butylated hydroxy toluene (Hedari and Heidarizadesh., 2005).

The instrument that was utilized: UV-Vis Spectrometer (Systronic double beam- UV- 2201).

Phytochemicals analysis of *P. Nodiflora*

P. nodiflora leaves extract was utilised to conduct early phytochemicals testing in order to identify significant presence of chemical compounds.

➤ Examine for carbohydrate

Molisch's test

Individually mixed and screened a little amount of 300mg alcohol and desiccated plant extracts powders of sample in 4ml.

Molisch's test was performed on the filtrate

Fehling's test: Using Fehling's solution, mix a little amount of extracting water.

Phenols test: A filter paper was used to catch the extract. The spot was treated with few drops of phosphor-molybdic acid reagents&subjected to ammonia vapors (Adegate *et al.*, 2006).

➤ Test for flavonoids

Shinoda test: A pieces of Mg & 1ml of strong HCl were added to 2 to3ml of extraction. Lead acetate test: 1 mL Pb acetate solutions was dissolved in 5 ml of extract (Petchi *et al.*, 2013).

➤ Test for tannins

Braemer's test: A 10% alcohol ferric chloride solutions was applied to 2 to 3ml extract (Parasuraman *et al.*, 2010).

➤ **Test for alkaloid**

Draggendorf's test: On a little portion of precoated TLC plate, a drop of extraction was detected, & the slab was coated with improved

Hager's test: Few more ml of Hager's reagent was added to the extract.

Wagner's test: Little more ml of Wagner's reagents was added to the extraction (Mandavi *et al.*, 2012).

➤ **Glycosides tests**

Legal's test: The extracts [0.1g] was mixed in pyridine [2000 µl], sodium nitroprusside solutions [2ml], and sodium hydroxide solution were used to make the solution alkaline (Petchi *et al.*, 2013).

➤ **Test for Saponins**

Foam test: 1.0 mL extracts was diluted in 20 ml purified water and agitated for 15 minutes with a graduated cylinder (Updated edition of Quality control methods for medicinal plant materials., 1998)

➤ **Test for Anthraquinones**

Borntrager's test: A total of 50 mg of powdered extracts were cooked in a 10% ferric chloride solution with 1ml strong HCl. The extract was chilled, processed, and diethyl ether was used to shake the filtrate. Strong ammonia was used to remove the ether extract (The Official Standard of Compendia., 2007).

➤ **Amino acids tests**

Ninhydrin test: A little amount of the extraction was mixed in the next few drops of ml of water, and 1ml of ninhydrin reagents was added (The Official Standard of Compendia., 2007).

Note: The following are the outcomes of the aforesaid experiments.

If the testing answer is strong, it will be marked as +++, indicating that the specific grouping is represented as the primary class.

If the reaction is average, mark it with ++, which denotes the existence of a considerable amount.

If the reaction is very small, mark it with a + to indicate that it is only present in traces. If there is no response, it is considered negative (Kumar *et al.*, 2013).

➤ **Total Flavonoids content**

Aluminum chloride technique 14 was used to estimate total flavonoid concentration utilizing quercetin as a reference. A volume flask was filled with 1 mL of test material and 4 mL of water (10 ml volume). After five min, add 0.3 ml of 5 % Sodium nitrite and 0.3 ml of 10% Al₂Cl₃. 1 ml of 1 M NaOH was introduced to the reaction's solution after 6 min of room temp incubation. With filtered water, the total volume was quickly increased to 10 ml. A spectrometer was used to compare the sample's absorption to that of a blank at 510 nm. For

precision, the process was repeated three times, and the results were given as mean standard error in term of flavonoid level (Quercetin equivalent, QE) per gram of dry weight (Lohar *et al.*, 2008).

➤ **Total Phenolic content**

To determine TPC in extract, the Folin–Ciocalteu assay was used. With certain adjustments, this test was carried out using the approach published by Velioglu. To make the crude specimen, liquefy 10 mg of the extraction in 10 mL of liquid to get a solution of 1 mg/mL. In the test tubes 100 mL of the extraction (1 mg/mL) was coupled with 0.75 ml of the Folin reagent. The liquid mix was invited to stay at room temperature for 5 min. After that, 0.75 ml (Na₂CO₃) was added to the reaction mixture, and the tube was shaken gently to combine everything. The absorption of the combination was determined at 725 nm using UV Spectrophotometer after 30 min. Gallic acid (concentrations ranging from 0.01 to 0.05 mg/mL) was used as the standard reference, and a calibration graph was constructed. TPC was measured in mg/ 100g of extract as gallic acid equivalents (Indian Drug Manufacturer Association., 2002).

4.2. Toxicological research

When a substance is supplied to a biological process in a research project, several reactions may occur in most cases, these really are desirable and helpful, but many of them are not. During development of a new drugs, manufacturers conduct acute, subacute, & chronic toxicity tests. The determination of LD₅₀ (the lethal dosage (causing death) to 50% of the tested group animals) involves toxic effects.

➤ **Chemicals**

Goel institute of pharmacy & Sciences, streptozocin. Aventis Pharma's standard Glibenclamide (Daonil). Ethanol (analytical grade) in a Dextrose solution of 5% Gluco Accu-Chek Active Blood Glucometer Kit.

➤ **Hypoglycemic Test**

The following are the groupings: Group I was given (CMC) 0.5 % (0.3ml/100g rat), Group II was given Glibenclamide (2 mg/kg), Group III was given ethanolic extract of *Phylla nodiflora*. – (200 mg/kg), and Group IV was given ethanolic extract of *Phylla nodiflora*. – (400 mg/kg). The tail nipping method was used to obtain blood samples, and the glucose level was measured using a glucometer. Following medication administration, blood samples are taken at 30, 60, and 120-minute interval (Waterborg *et al.*, 2002).

➤ **Test for Glucose Tolerance in the Oral Mucosa**

The following are the groupings: Group-1 was given (CMC) 0.5 % (0.3ml/100g rat), Group-2 was given Glibenclamide (2 mg/kg), Group-3 was given ethanolic extracts of *Phylla nodiflora*. – (200mg/kg), and Group-4 was given ethanolic extract of *Phylla nodiflora*. – (400 mg/kg). Before medication or solvent treatments, all of the rats were fed for 24 hours and blood samples were

taken. The medication, extraction, and solvent were given to various sets of rats and 30 minutes later, all of the rodents were given sugar directly at a dosage of 10gm/kg body mass utilising an vocal feeding needle. The tail nip method was used to obtain samples taken, and the blood glucose was measured using a glucometer. Following medication delivery blood specimens were taken at 30; 60; & 120-minute intervals (Petchi *et al.*, 2012).

Following an overnight fast rat were given a particular dosage (100 mg/kg) of streptozocin monohydrate mixed in SC buffer to induce diabetes. Rats were fed feed and libitum after 1 hour of streptozocin monohydrate injection, as well as 5 % dextrose solutions in a feed bottle for day to overcome the early hypoglycemic phase. After a week of stabilization, animals with blood glucose levels more than 200 mg/dl were chosen for the investigation (Sharma *et al.*, 1997).

4.2.1. Introduction of diabetes to animals

Using the usages of an orally feed needle, plants leaf extract normal medication, and saline solution were given. Group I was used as a control group and was given regular saline for 14 days. Diabetic controls rats were in groups II through V. For 14 days, Groups IV and V (who had previously received streptozocin 100 mg/kg) were administered constant dosages of ethanolic extract (200 mg/kg, P.O, 400 mg/kg, P.O) of *Phyla nodiflora*., whereas Group-3 was given the conventional medication Glibenclamide (2 mg/kg, P.O). (EEBAL-*Phyla nodiflora*. Ethanolic Extract) (Waheed *et al.*, 2006).

4.2.2. Animal Ethics Committee

The rats utilised were male S. albino rats weighed between 100 and 200 g. They were kept in conventional temperature & relative humidity settings with a 12:12 h light: dark cycle. The rats were given a conventional pellet diet and free access to water. Fasted animals (on sample days) were denied food for 16 hours but given unrestricted access to clean water. The research was conducted in the Department of Pharmacology, and the study protocol was authorized by the Goel institute of pharmacy & Sciences Lucknow, Institutional Animal Ethics Committee (IAEC). Application number (CPCSEA) Proposal number (2014/Po/Re/18 CPCSEA) and followed the IACE criteria.

RESULTS

Phytochemical analysis

Table 01: Phytochemical analysis of *Phyla nodiflora* extracts.

Phytochemicals	Results		
	Hexane	Ethanol	Distilled water
Alkaloid	-	+	+
Tannin	+	+	+
Flavonoid	+	+	+
Glycoside	+	+	+
Amino acid	-	+	+
Protein	-	+	+
Carbohydrate	-	-	-

Note: +ve stands for positive and -ve for negative.

Induction of diabetes

A single intraperitoneal (I.P.) dosage of Streptozocin 100 mg/kg was given to nightly animals to develop diabetes (Katara *et al.*, 2012).

Blood specimens are taken

Fasting plasma specimens were taken from rats' retro orbital punctures at monthly interval until the study's end, at 1, 7, and 14 days (Sen *et al.*, 2011).

Biochemical variable estimate Blood glucose levels in the serum

Fasting plasma specimens were taken and blood glucose levels were measured after 1, 7, and 14 days of fasting sugar level in blood.

The quantity of sugar in the blood samples received from the animal is measured by the blood glucose level tests. The tests are frequently done to look for high sugar level in blood, which can indicate diabetes or insulin resistance (Rahman *et al.*, 2021).

Experimental design

We used a single-day, single experiment with serial blood collection. The fasting rats were separated into five groups, each with six animals: Standard Glibenclamide (2 mg/kg), ethanolic extract of drug (200mg/kg), (400 mg/kg). The medications were given to all of the groups orally at the prescribed doses, and the timing of dosing was recorded by each group. Blood specimens were obtained utilizing the tail clip method, & glucose levels were determined before treatment (pre-dose, 0 hour) and after dosing at one, two, three, and four hours, correspondingly, utilizing the tail clip method (Abu-Odeh *et al.*, 2021).

Statistical analysis

Statistics research was performed by utilizing PRISM 5.0. All the data of Biochemical variables and body mass were represented as SEM. The values were examined for statistically relevance utilizing (ANOVA), comparing was performed by employing Dunnett's t test. P values less than 0.05 were deemed significant P values ≤ 0.01 were deemed very substantial, P ≤ 0.001 were deemed extremely substantial, and were not substantial (Mannan *et al.*, 2014).



Figure 01: Phytochemical tests of ethanolic extract of *Phylla nodiflora*.

The phytochemical analysis explored that in Molisch's tests no specific remark showed the nonexistence of carbohydrate, biphosphate-molybdic acid tests presence of blue color spot expressed the phenols presence. Red or pink color by Shinoda and Lead acetate test showed the existence of flavonoids similarly the white PPT.

The dark blue/ greenish grey color absence in the solution expressed there is no tannin in drugs. Orange color spot indicated the existence of alkaloids. Brownish or yellow precipitate also indicates the alkaloids presence. Red to pink coloration expressed the presence of glycosides. Foam's layer is not present which shown the absence of saponins.

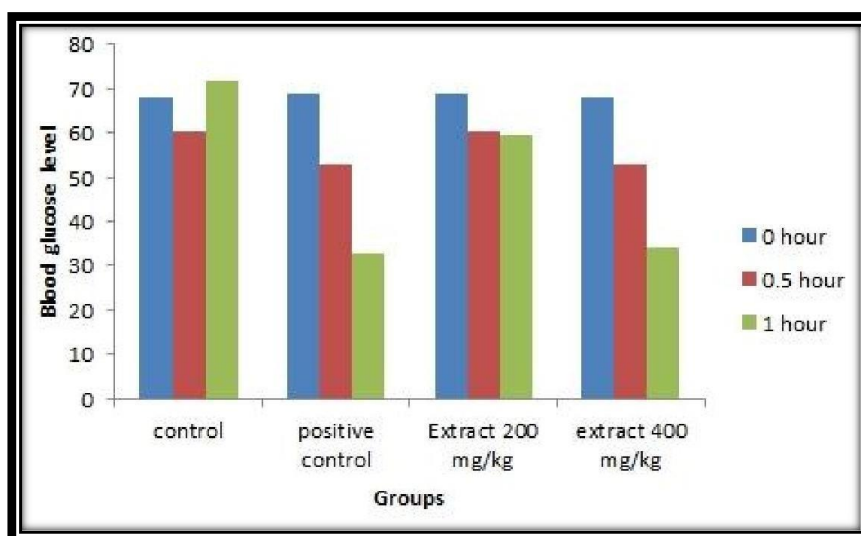
Hypoglycaemic test

Table 02: Hypoglycaemic Test.

TREATMENT	DOSE mg/kg	LEVEL BLOOD GLUCOSE (mg/dl)		
		0 hour	0.5hr	1 hr.
CMC as control	0.4%	65.00±2.329	67.17±2.487	70.83±3.372
Glibenclamide +ve control	2	67.00±0.6325	52.83±4.037**	32.83±1.515***
Ethanolic extract of <i>Phylla nodiflora</i>	200	67.80±4.245	60.17±2.497*	59.33±2.584*
Ethanolic extract of <i>Phylla nodiflora</i>	400	67.00±4.429	53.00±2.309**	35.17±1.138***

Glucometer is used for the analysis of glucose levels & values are termed as the standard deviation (n= each group consist six animals) (p less than 0.05) *, (p less

than 0.001) ** & (p less than 0.0001) *** as juxtaposed positive control and controls group calculated by one way, ANOVA followed by Dunnett's test.



Graph 02: Graphical representation of the hypoglycaemic test.

After hypoglycaemic test it was found that the 200 & 400 mg /kg concentration of ethanolic extracts of *Phylla nodiflora*. significantly minimize in serum sugar concentration ($18.83 \pm 3.879 \downarrow$ & $0.84 \pm 1093 \downarrow$) (P value

less than 0.05) *, (P value less than 0.001) ** (P value less than 0.0001) *** as on comparison with control and positive control.

In vivo antidiabetic analysis**Glucose Concentration in blood and the Impact of Ethanol extract****Table 03: Glucose Concentration in blood and the Impact of Ethanol extract.**

SL. No.	TREATMENT	Blood glucose level (mg/dl) day		
		Day-01	Day-07	Day-14
1	Control 10 ml/kg P. O	78.54±2.833	72.7±4.014	74.7± 4.944
2	-ve control	265.2±3.85	270.1±2.9	275.2±2.5
3	+ve control (Glibenclamide 2 mg/kg) P. O	259.73±3.386	145.13±2.8***	122±3.8***
4	Ethanol extract of <i>Phyla nodiflora</i> . 200mg/kg P. O	253±3.1	242.3±3.18**	232.2±3.40**
5	Ethanol extract of <i>Phyla nodiflora</i> . 400mg/kg P. O	263±4.55	183.1±2.88***	162.1±1.8***

Note: Positive control is Glibenclamide (2 mg/kg P.O).

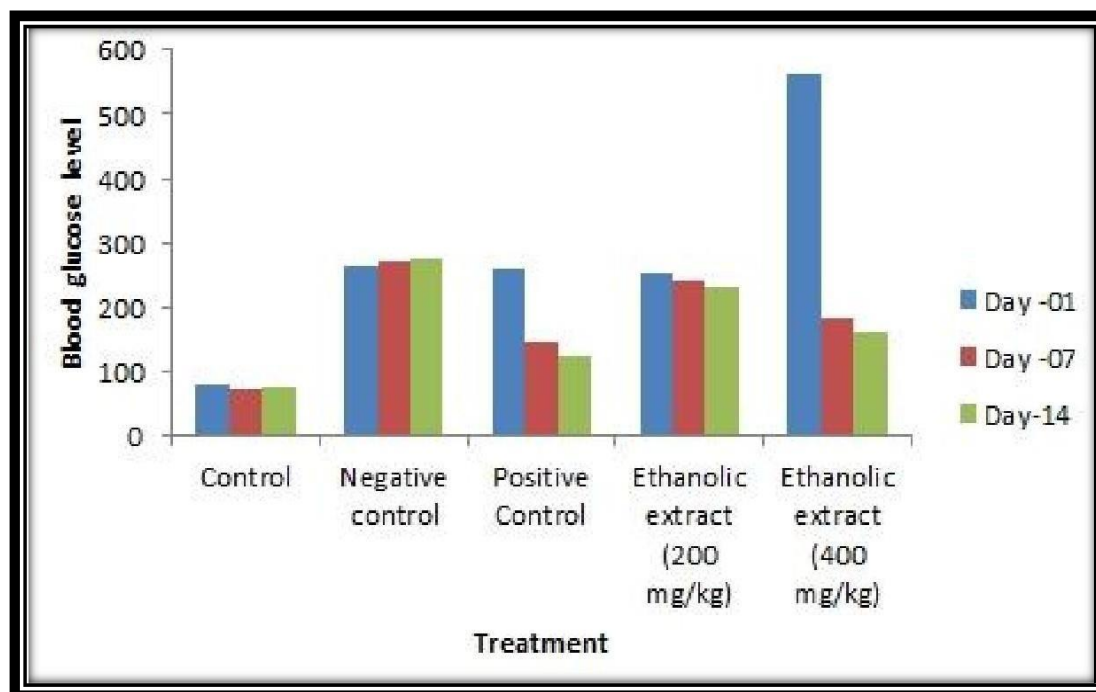
The above results have explained on Table. The sugar concentration in blood was elevated in negative control if contrasted to another group and controls. Initially every members of animal groups were affected in diabetes, which means the increase in blood glucose level by doing slightly changes ($4.13 \pm 1.207 \downarrow$ and $1. \pm 0.93 \uparrow$) for controls groups at seventh and fourteenth day. On day seventh sugar level was importantly reduced Glibenclamide 2mg/kg treated group ($120.2 \pm 1.414 \downarrow$ and $23 \pm 1 \downarrow$) (P less than 0.05) *, (P less than 0.001) ** and (P less than 0.0001) *** when related to control at 7th and 14th days. The ethanol leaves extract of *Phyla nodiflora*. treated group.

200&400 milligramkg⁻¹ were doses-based manner reduced (P less than 0.001) **& (P<0.0001) *** ($10 \pm 0.362 \downarrow$ & $90 \pm 1.67 \downarrow$) When contrasted to the, control

group the +ve control group showed higher anti-diabetic activity on the seventh day.

The ethanolic extracts of *Phyla nodiflora*. at a certain dosage 400milligramkg⁻¹ have equipotential characters ($90 \pm 1.67 \downarrow$ & $120.2 \pm 1.414 \downarrow$) During the 7th day, as matched to a favourable control. The Ethanolic extract of *Phyla nodiflora*. 200 and 400 milligramkg⁻¹ have been shown to have a dose-dependent anti-diabetic effect (P less than 0.001) **&(P less than 0.0001) *** when compared to control and positive control. On day 14th, ethanolic extracts of *Phyla nodiflora*.

Drug treated animal 200 and 400 milligramkg⁻¹ significantly dropped down and maintained the sugar levels in blood ($5.1 \pm 0.07 \downarrow$ & $11 \pm 1.08 \downarrow$), (P less than 0.001) **&(P less than 0.0001) *** when comparatively analyzed to all positive control and controls.

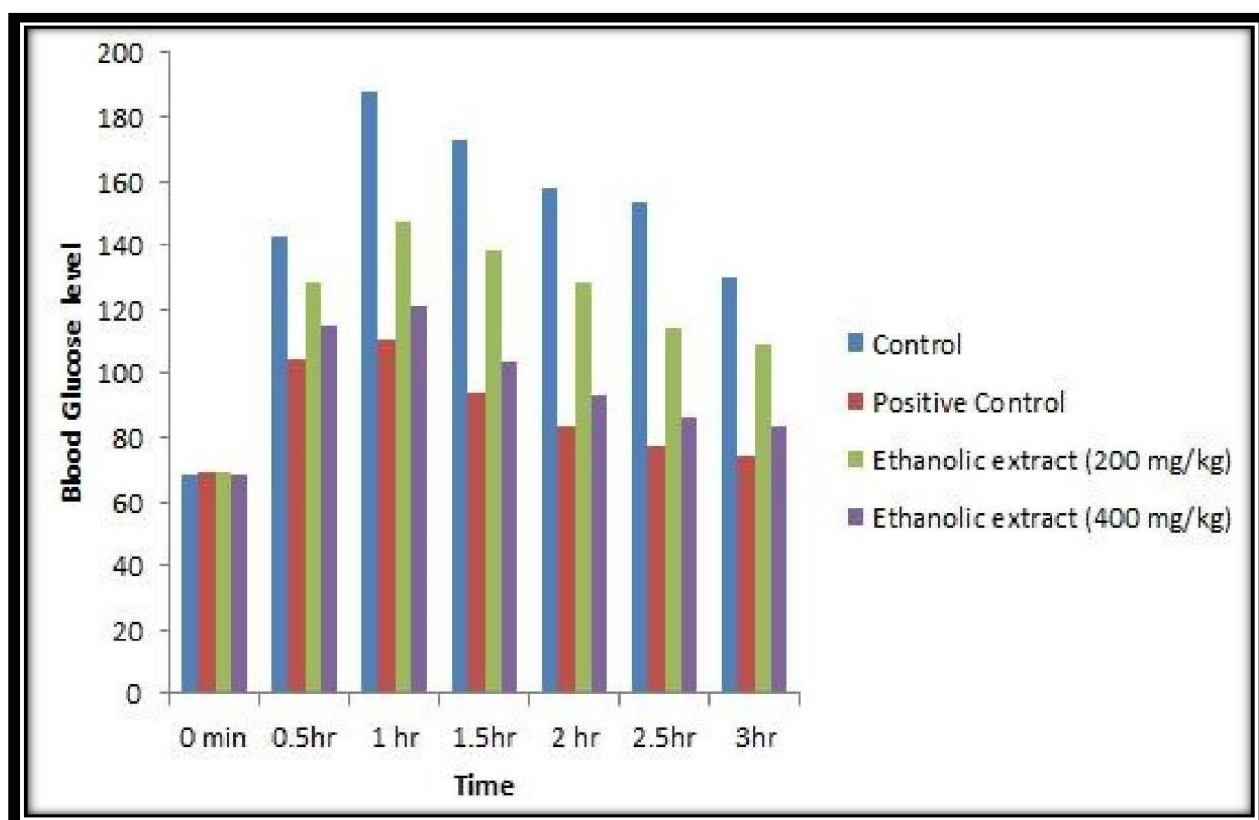
**Graph 03: serum sugar Levels and the Impact of Ethanolic Extract.**

Oral Glucose Tolerance Test (OGTT)**Table 04: Oral Glucose Tolerance Test.**

TREATMENT	DOSE mg/kg	Blood Glucose Level (mg/dl)						
		0 min	0.5hr	1 hr	1.5hr	2 hr	2.5hr	3hr
Control	0.5 %	68.00	142.5±	187.5±	172.5	157.5±	153.5±	130.2±1
(CMC)		±2.42	6.292	9.465	±12.2	12.38	12.83	3.31
		9			5			
+Ve Control	2	69.00	104.2±	110.5±	93.67	83.67±	77.17±	74.33±2
Glibenclamide		±0.63	7.323*	6.980	±1.30	1.308	4.070*	940
		25	*	***	***	***	**	***
Ethanolic	200	68.80	128.3±	147.3±	138.5	128.5±	113.8±	108.8±6
Extract of		±2.	6.009	2.404	±5.66	5.667	6.760*	107
<i>Phyla</i>		245		*	7	*	*	**
<i>nodiflora</i>					*			
Ethanolic	400	68.00	115.0±	121.2±	103.3	93.33±	86.67±	83.67±2
Extract of		±2.	6.191*	6.188	±4.76	4.766	3.602*	906
<i>Phyla</i>		429	*	**	6	*** a	**a	***a
<i>nodiflora</i> .					***a			

The sugar level was examined by utilizing glucometer and the values are shown as the Mean ± SEM (n=six), G-II was juxtaposing with G-I, G-III&IV was studied

comparatively with group-II; *p value less than 0.05, **p less than 0.01, p less than 0.001*** & analyzed by one way, ANOVA followed by Dunnett's test.

**Graph: 04.****OGTT**

Oral Glucose Tolerance Test (OGTT) demonstrated on above table and graph. After treatment of glucose. The glucose levels in blood of every animal groups increased significantly. After treating with aqueous ethanolic extracts of *Phyla nodiflora*. 200 and 400 mg/kg the blood glucose levels were decreased (P less than 0.001) ** and

(P less than 0.0001) ** when likened to positive control&control at defined time interval. blood sugar readings (200 mg /kg) at 1 hour and every 12 hours: 6.66±1.164&8.8±3.26, 10±0, 3±0.696, 400 mg/kg: 9.97±0, 17.9±1.422, 14.7±1.093&5±0.696) (P less than 0.05) *, (P less than 0.001) **&(P less than 0.0001) *** was modifications in the dose dependent extracts treated

animals' groups compared with positive control&control but 400 mg/yield the equipotent activities.

DISCUSSION

streptozocin, a beta cytotoxic, diabetes-inducing substance that affects a wide range of animal species by destroying the pancreatic insulin-secreting cells, is the streptozocin -triggered diabetes mellitus in rats is caused by a concept. According to the literature, streptozocin -induced rats are hyperglycemic. Even though the rats were irreversibly diabetic, lesser dosages of streptozocin (100 mg/kg) caused partial loss of pancreatic -cells. As a result, these creatures have surviving cells and can regenerate. Sulfonylureas are known to function by activating the Langerhans islets cells to produce more insulins,&such substances are vital.

The ethanolic extract of *Phyla nodiflora* was subjected to in vivo anti-diabetic screening for validation of the stated mode of action in a biologically system. The Ethanolic of *Phyla nodiflora* (200 mg/kg p.o., 400 mg/kg p.o.) demonstrated a statistically important reduction in sugar level of serum at the conclusion of the study. As a result, the ethanolic extract of *Phyla nodiflora* was found to have anti- diabetic properties. This work will help researchers working on diabetes mellitus and associated disorders discover novel entities Type 2 diabetes is treated using this drug

CONCLUSION

The whole plant extracted using a progressive extraction process. The active extract from *Phyla nodiflora*. Whole plant extract was examined in an invitro anti - diabetic testing approach employing solvents with rising polar order hexane, ethanol and distilled water). The initial bioactive compounds analyses revealed the existence of Flavonoid, Phenol, Glycoside, Alkaloid, Saponin, and Terpenoid in the ethanolic extract of *Phyla nodiflora*. Finally, streptozocin -triggered diabetic rats were used to examine the in anti-diabetic's effect of Ethanolic extract of *Phyla nodiflora*. In rats, an acute toxicity investigation was conducted. A fasting blood sample was taken from a rat retina ocular incision at week periods until the trial's end (1, 7, and 14 days). sugar level of fasting levels was obtained & analyzed on these days. At the climax of the research (14th day), diabetes mellitus groups cured with ethanolic extract of *Phyla nodiflora*. (200 mg/kg p.o. and 400 mg/kg p.o.) showed statically significant decreases in glucose levels, similar to the conventional drug Glibenclamide (2 mg/kg), indicating that the ethanolic extract of *Phyla nodiflora*. (200 mg/kg p.o. and 400 mg/kg p. The current study concluded that the separation of active ingredients from an ethanolic extract of *Phyla nodiflora* and describing the chemicals utilizing qualitative phytochemical investigations.

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